



Inter-Species HALYs: Ethical Considerations of Well-Being Measurement across Multiple Species

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Abstract

Health-adjusted life years (HALYs) are population health measures which describe morbidity and mortality combined as one number. HALYs play a fundamental role in cost-effectiveness analysis, making it possible to compare the quantity of health-related well-being purchasable for a given investment across a range of initiatives. Currently, however, no such health measures consider human and non-human animal well-being simultaneously, representing both a philosophical and practical void in the field. This thesis looks to assess the ethical landscape surrounding the simultaneous assessment of inter-species well-being. It analyses various theories of well-being, then discusses various possible stances on relative species value and how they might be relevant to the calculation of an inter-species HALY.

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Keywords

Inter-species well-being, cost-effectiveness analysis, health-adjusted life years (HALYs), health-related quality of life (HRQL), consciousness.

1 Introduction

The well-being of non-human animals is becoming an ever more prominent topic of discussion and debate. Its rise to the ethical stage has been characterised by an increased support for animal rights groups such as People for the Ethical Treatment of Animals (PETA), the introduction of legislation recognising animal sentience such as the European Union's Lisbon Treaty (European Union, 2007, p.49) and the rise of flexitarian, vegetarian and vegan diets, with 25% of UK millennials now following one of these three lifestyle choices (The Vegan Society, 2018). Furthermore, initiatives such as the Effective Altruism movement and the Open Philanthropy Project advance animal well-being as a large-scale and relatively neglected problem, and consequently recommend related charities as particularly worthy causes for donation (Whittlestone, 2018) (Open Philanthropy Project, 2018). Currently, various methods exist for conducting cost-effectiveness analysis on human well-being, health-adjusted life years (HALYs) representing some of these, however, none consider human and non-human animal well-being simultaneously. This leaves us entirely in the dark as to the relative scale of suffering across species, and the level of cost-effectiveness represented by non-human animal well-being initiatives. This thesis will discuss the ethical landscape surrounding well-being across all species, considering the various potential factors in assessing relative species value, as well as the different approaches to measuring well-being that might be relevant to an inter-species measure.

2 HALYs introduced

1.1 Background

Health-adjusted life years (HALYs) is an umbrella term for health measures which describe morbidity and mortality as one combined number and can be considered as a kind of population well-being measure. HALYs find use in situations where financing for health interventions is financially limited, providing the groundwork for well-being-based cost-utility analysis. HALYs come in two forms; quality-adjusted life years (QALYs) which consider the benefits of health improvements, and their counterparts disability-adjusted life years (DALYs) which consider the negative effect of ill-health on well-being. QALYs were developed first in the late 1960s and were primarily designed to compare

the price of producing a unit of health through different health interventions (Packer, 1968). Health in QALYs is based on reported values given by individuals for their own overall health states and the health states of others, creating a measure of health expectancy – a good to be maximised. DALYs followed in 1993 as an attempt by the World Health Organisation to assess the Global Burden of Disease (World Bank, 1993). Unlike QALYs, DALYs measure health as an expert-assessed value for specific diseases, measuring instead a health gap – a bad to be minimized.

The calculation of a HALY, whether QALY or DALY, broadly follows the same general formula. Firstly, a description of health between 0 and 1 is created, either from the values given by individuals or by expert opinion. In QALYs, 1 represents full health and 0 represents death. In DALYs, this is reversed so that 1 represents full disability (death) and 0 represents full health. This Description of health, the health-related quality of life (HRQL) measure, is then multiplied by life expectancy to produce either the number of years of full health expected (quality-adjusted life years) or the number of years of full disability expected (disability-adjusted life years). The general HALY formula is depicted in Figure 1 below. In this thesis and for the purposes of considering a broad range of ideas about well-being, the term

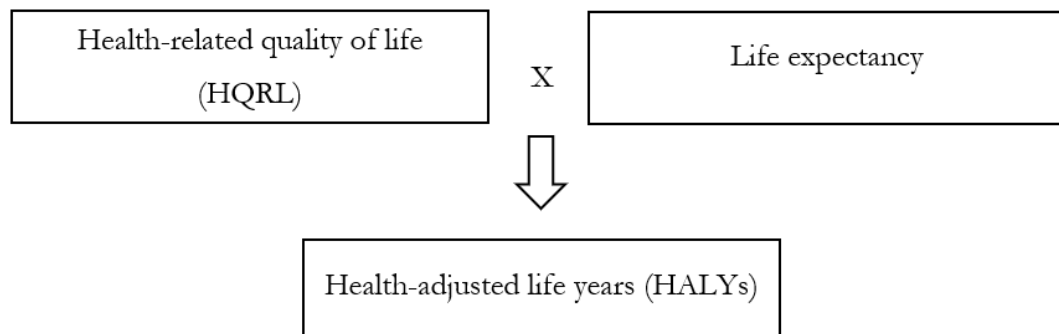


Figure 1: The general HALY formula

1.2 Discussion of HALY Assumptions

HALYs are typically employed for cost-effectiveness analysis and thereby make certain ethical assumptions by promoting the maximisation of well-being interpreted in the form of health. For example, the non-profit GiveWell takes a cost-effectiveness approach similar to HALYs by recommending donations to Schistosomiasis Control Initiative

which de-worms children, this reduces illness and so increases school attendance promoting development. De-worming is very cheap and therefore represents considerable value for money, however, it has only minor benefits for each individual treated. Similarly, HALYs might, because of the cost of their treatment, leave some in great suffering and instead prioritise other less serious issues which represent a greater health gain per pound spent. This kind of decision-making approach reveals HALYs' utilitarian origins and fundamental aggregative assumption.

Utilitarianism generally defined is the view that the morally right action is that which produces the most good. Good, according to the utilitarian, is achieved through the maximisation of utility; the total or average amount of pleasure, happiness, etc minus the total pain, suffering, etc across a population. Bentham describes this principle of maximising utility as “the principle that approves or disapproves of every action according to the tendency it appears to have to increase or lessen—i.e. to promote or oppose—the happiness of the person or group whose interest is in question” (Bentham, 1789, p.7). In other words, utilitarianism is morally aggregative with regards to its concept of well-being. As mentioned, HALYs assume a comparable aggregative approach and similar value statement in their calculation of population health.

This position, however, might not seem entirely self-evident. As will be discussed later various alternative viewpoints exist as to the objective value of the same well-being experience in different individuals. For example, in *A Theory of Justice*, Rawls proposes the difference - or maximin - principle through which the lot of the worst off should be maximised in any situation where a range of well-being states occur. The Rawlsian might, therefore, see funding de-worming instead of, for example, a very expensive cancer treatment as unjustified, seeing the life-saving effects of the cancer treatment as more valuable than the (albeit additively much greater) value of de-worming.

A further assumption that seems potentially unjustified is QALYs' setting of death as the 0 point for well-being (or 1 in the case of DALYs). This essentially assumes that no level of suffering will ever be worse than death. Furthermore, it assumes that we should always act to improve someone's well-being rather than letting them die, even if they will never achieve a state of well-being which they perceive as preferable to death. Whilst medically it might be said that health states objectively reduce until death, when such a measure is used within ethical analyses 'health' becomes a measure of well-being; what is good for a person. It is therefore not clear in this context that death is the 'worst'

state of health. Given that there is a point at which life support machines are turned off, that suicides do occur, and that euthanasia clinics exist and are used; it might well be argued that expert opinion and people's preferences do not coincide with the assumption of death as the lowest aggregative level of well-being. Negative forms of well-being, and therefore negative life years are not unimaginable, certain experiential states being seen as worse than death for example. On a well-being scale that stretches below 0, a given well-being improvement remains exactly that, be it from -4 to -2, or 2 to 4. In situations where continuing to live is in fact worse than death, but death is *not* an option, a given health improvement could therefore still be judged as in the individual's interests as it would make their continued existence slightly less unbearable.

It might be responded that HALYs don't intend to choose an ethical stance on death; that they simply exist to measure health improvements and that this goal may be met no matter how the extremes of the scale are anchored. However, if death is to be considered as an option and an individual is in a situation where their well-being cannot rise above a state preferable to death, a scale that extends below death (0) would allow for compassionate euthanasia, or the ceasing of life-prolonging measures to be considered as a possible course of action. Certainly, expensive life-prolonging interventions do not seem justified if their cessation (and consequently death) is concluded to be better for the patient. This ethical interpretation is, however, entirely unavailable if death is by definition considered maximally bad. Since the problem of the value of death is a species-independent issue it will not be considered further here, however, it should be noted as an issue of potential concern in HALYs which endures when applied to species other than humans.

Finally, it should be noted as fundamental to this thesis that current HALYs only consider the well-being of members of the human species. By disregarding other species they make the tacit assumption that human being well-being is the only one worth maximising, or that it should be considered as a separate good to the well-being other species.

3 The need for inter-species HALYs

One major problem with using health measures such as HALYs for cost-benefit analysis is their sole focus on *human* well-being. By only considering human health states and

diseases HALYs implicitly disregard every other species that, like humans, can benefit from well-being improvements and have an aversion to suffering. Such a bias does not seem justified, especially as most people do accept some kind of moral duty towards animals. For example, in Great Britain 91% of people agree with the statement 'we have a moral duty to minimise animals' suffering as much as possible' (Ipsos MORI, 2005).

If we do indeed have an ethical duty to animals with respect to their well-being, then it follows that such a duty to should be able to be considered in ethical cost-effectiveness analysis assessments. Faced with a trade-off between relieving a dog's boredom and saving a million hamsters from extreme pain, surely few would argue that there is no morally correct answer. Most people, I imagine, would favour the hamsters. However, faced with one bored hamster and a million dogs suffering agony our intuition, I should imagine, switches to the dogs. Clearly then we must accept that comparing moral worth across species is possible, a middle ground does exist balancing what matters to a dog and a hamster. An interspecies HALY would attempt to do just this; in measuring the interests of both dogs and hamsters (and all other sentient species), it would provide a considerably superior basis on which to make the trade-off decision than simple gut feelings.

An extension to all species would increase the flexibility and relevance of HALYs, making them more suitable for a wider range of uses. QALYs, for example, are currently used extensively by the National Institute for Health and Care Excellence (NICE) to advise the NHS on drug research funding (Dobson, 1999). With the addition of animal HALYs such approaches would be available to veterinary science too. The Animal Health and Welfare Board for England's recent policy paper *AHWBE recommendation to allocate funds for animal health and welfare* (Department for Environment Food & Rural Affairs, 2018), for example, might have benefitted from the use of animal HALYs to measure the benefits of its recommendation for increased funding during the 'Brexit' transitional period. This would also have allowed for direct comparison to other similar areas of spending so as to demonstrate value for money.

As an example of current application, DALYs are presently used by the non-profit GiveWell to rank charities based on how cost-effective they are at improving well-being, and thereby provide recommendations to donors on the most effective ways to give (GiveWell, 2018). Currently, however, only human charities are considered. The Centre for Effective Altruism (Effective Altruism, 2016) performs a similar function, however, charities are divided into animal and human categories leaving the donor to make an

entirely speculative and uninformed decision as to which categories they feel are most deserving. In this situation an inter-species HALY would represent a considerable step forwards in tools available to organisations such as GiveWell and the Centre for Effective Altruism, allowing for a more complete and inclusive ethical accounting in charitable giving.

4 Inter-Species HALYs: what are the options?

Once the ethical value of animal well-being accounting is granted, there remains a considerable potential discussion as to the relevant factors involved in calculating an inter-species HALY. This is clearly a controversial subject mired in emotional intuition and historic precedent, as well as a wide range of potential lines for argument, however, if such a measure is to be realised a fully justified approach to relative well-being value must be established. As previously stated, in order to produce a HALY a measure of health state between 0 and 1 is produced (The HRQL weight), this is then multiplied by an expected lifespan. If an inter-species HALY measuring any form of well-being is to be realised, then a suitable method for generating HRQL weights must be created or chosen. This might consist in one single health state measure applied across all sentient species, or it might require several different species-specific measures. Furthermore, it might be argued that a HALY should not be valued equally across all species. Figure 2 below presents how an inter-species HALYs might be calculated. In the following section I discuss the arguments surrounding the relative value of different species' well-being, and various approaches to measuring well-being that might consequently be used as a basis for inter-species HALYs.

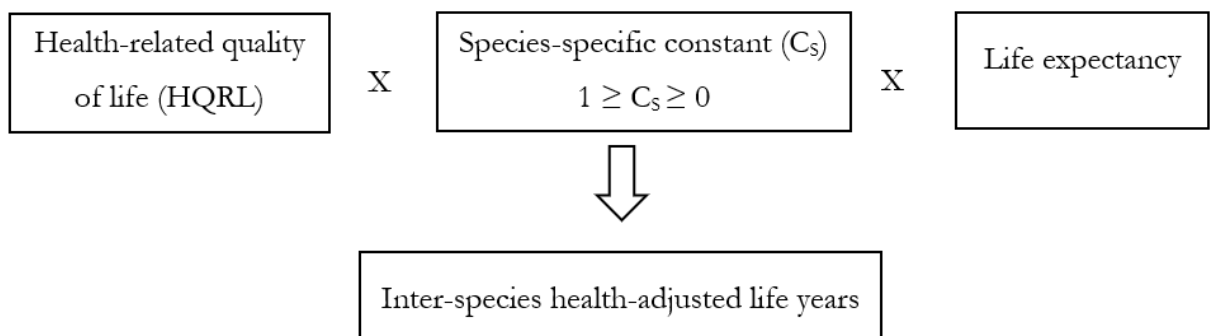


Figure 2: A potential inter-species HALY formula

1.3 Species-Specific Factors in Well-being

In the following section I discuss various theories about well-being and how they might relate to an interspecies HALY. These would regulate what factors are measured in different species or individuals when assessing well-being. Whilst it will certainly not be possible to conclude on a final interpretation of well-being which applies to all species, nonetheless it will be relevant to note the various theories about well-being when considering its measurement across a range of dramatically different individuals. It should also be noted that whilst the theories considered here are broad, they are far from exhaustive; indeed, each one represents its own field of theories within which multiple variations exist.

1.3.1 Hedonism: Pleasure/Pain

Hedonism about well-being can be described by the following:

1. All pleasure and only pleasure is good for us.
2. All pain and only pain is bad for us.
3. A person's level of well-being is dictated by the balance of pleasure and pain they are experiencing.

In the first chapter of *An Introduction to the Principles of Morals and Legislation*, Jeremy Bentham, a founding figure in utilitarian thinking, states that "Nature has placed mankind under the governance of two sovereign masters, pain and pleasure. They alone point out what we ought to do and determine what we shall do; the standard of right and wrong" (Bentham, 1789, p6). This underlines the key hedonistic claim that what matters in maximising utility is the pleasure/pain scale. When discussing the ethical status of non-human animals Bentham therefore argues that "The question is not Can they reason? or Can they talk? but Can they suffer?" (Bentham, 1789, p.144). Bentham maintains that if pleasure and pain are what truly matters, then we must attribute ethical value to any individual to whom such mental states are available. The fundamental morally relevant trait that we share is, according to Bentham, not our species, but our ability to suffer.

This approach to inter-species HALYS might ideally look to measure well-being directly; for example fMRI brain scan data is becoming ever more reliable at measuring levels of pain in humans using SVM models (Brown *et al.*, 2011, p.2), and levels of happiness as indicated by the activation of so called 'hedonic hotspots' such as the

orbitofrontal cortex (Bozarth, 2015, p.35). Equal quantitative pain or pleasure measurements between individuals under this approach might lead to equal value judgements. Apart from the considerable practical challenges that this approach would face with measuring and comparing levels of pleasure across species however, it does not seem obvious that pleasure and pain are the only things that matter to all animals. Indeed, even if hedonism is shown to be the correct model of human well-being, it does not necessarily follow that the same is true for all creatures. Might it not be possible to have a theory of well-being for a sentient species that does not feel pain? If an individual is under local anaesthetic, and so immune to pain yet still conscious, it still seems intuitively wrong to argue that no action we can do to it will negatively affect its well-being.

The hedonist might respond that any further negative affects might be seen as impeding the individual's pleasure, thus explaining our intuition that we can still do it harm. However, even if we do concede this point to the hedonist, it does not seem clear that the extent to which certain levels of pleasure and pain are valued will be the same across all individuals, let alone all species. It seems plausible that the degree of such signals might well be to some degree proportional to the animal's body or brain size. If this were to be the case, would we not be committed to the assumption that a major factor when distinguishing ethically between species is size? Say 'level ten' pain for a blue whale is triggered by two thousand times the C-fibre stimulation needed to trigger the same response in a human being (about the same as the ratio of body masses), are we to say that the blue whale's pain is two thousand times worse, and therefore two thousand times more worth alleviating? The hedonist may reply that, instead, measures of pleasure and pain should only be considered intra-species, and rely on some other factor when comparing value between species. Regardless, the problem remains that even amongst different human beings some may be more or less averse to pain than others, with higher or lower apparent pain thresholds according to their physiology. Although these differences may be smaller than those between species, it might still seem unreasonable that one person's level 10 pain might be considered worse than another's, resulting in them having comparatively more valuable extremes of well-being. One way to avoid this problem might be to consider well-being instead through the perspective of individual preferences.

1.3.2 Desire Fulfilment:

A desire fulfilment model of well-being might solve the problems posed by hedonism by focussing not on levels of pain, but on preferences for different states of being, whatever those might be. Although intra-species variation might still occur in preferences as in pain, it does not seem unreasonable to value one individual's pain (or any other undesired experience) less than another's if it transpired that they were less bothered by it. Desire fulfilment theory (DFT) about well-being might be described as the following:

DFT: Something is (non-instrumentally) good for you if and only if and because it fulfils a non-instrumental desire of yours. Something is (non-instrumentally) bad for you if and only if and because it frustrates a non-instrumental desire of yours.

(Fletcher, 2016, p.28)

Pleasure might, under this system, also be considered a component to well-being, but not because pleasure is the fundamental unit of well-being (as held by hedonism), but because the individual desires pleasure. In an instance, therefore, where an individual does not desire pleasure, pleasure will no longer persist as a component of well-being. Imagine a period of mourning, for example, where an individual may perceive reflection, however painful, as more important than happiness in that moment. DFTs would allow such a preference to be judged as good for the individual simply because they desire it. A particular form of desire fulfilment, for example, is used in QALYs where individuals rate their experience of different health conditions, or their preference for potential health conditions.

Our epistemic access to the internal experiences of non-human animals, however, is more restricted than in other humans to whom we can make empathetic assumptions, consequently this approach to measuring well-being would need to rely on various preference tests; especially in species without language and other methods of communication. For negative preferences/aversion there has been some success recently with scientists noting that injured and lame broiler chickens are more likely to eat feed containing painkillers, this would therefore suggest an aversion to pain (Danbury *et al.*, 2000). This raises the question however as to whether the painkillers do indeed directly improve the chickens' well-being, or whether they simply serve as a temporary relief from a stimulus which exists to prevent further well-being losses. The chicken may, whilst under pain relief, be more likely to injure itself further despite not at that point showing aversion to the injuries, so that it is not obvious that its preferences really describe to a

full extent the factors contributing to its well-being. Especially among species without a concept of the future it therefore seems problematic to assume that by following their conscious preferences in the moment we will fully meet their well-being needs.

Such inconsistencies in desire and perceived well-being might be explained by arguing that the objects of desire are relevant to well-being only because they tend to track some other measure. For example, different species might be said to have evolved to desire the particular things that are generally good for them. As Guy Fletcher argues “Desires are reliable *trackers* of prudential value rather than creators of it” (Fletcher, 2016, p.45). The desire theorist might respond noting that whilst evolution, or some other factor, may have driven different species to desire certain things, this does not alter the fact that what individuals experience and care about in the moment are desires. Whether or not one accepts the preference hypothesis, the ‘tracking’ concern might lead us to consider alternative foundations for well-being, with the possibility of different sources for different individuals and species.

1.3.3 Objective List Theories

Objective list theories (OLTs) about well-being claim that some things are good for individuals whether or not they desire them, in other words they deny that an individual’s desire is relevant in discerning what is good for it, a position known as attitude-independence.

Attitude-independence: it is *not* the case that G is non-instrumentally good for S only if S desires G.

(Fletcher, 2016, p.50)

OLTs span many different ideas about what is good. Since these theories are considered ‘objective’, we are therefore also not free to make our own lists; OLTs claim that “the items on the list are all and the only things that are good for all humans” (Fletcher, 2016, p.49). Amongst current well-being assessment methods in non-human animals OLTs form the majority, with Welfare Quality, the Animal Needs Index, TGI200 and the Animal Welfare Assessment Grid all citing various lists of things that are ‘good’ for a species, and that should be pursued by those responsible for their well-being. For example the most recent, Welfare Quality, measures well-being in terms of four defining principles; “Good feeding, Good housing, Good health, and Appropriate behaviour” which are

broken down into 12 welfare criteria, each criterion being measured by various species-dependent indicators (Canali and Keeling, 2009). The components of the welfare principles are claimed to “reflect what is meaningful to animals as understood by welfare science” (Welfare Quality® consortium, 2009, p.14).

We must be wary of groupthink however; simply because something has been done a certain way *practically* in the past does not mean that it is the *philosophically* most justified option. A common argument against OLTs is that they often struggle to provide an explanation for the components on the list or justify their relative importance to each other. For example, it is not clear that ‘appropriate behaviour’ and ‘good health’ should be valued equally in the Welfare Quality measure (Sandøe *et al.*, 2018, p.16). Additionally, it does not seem clear why certain items appear on each list, for example, the Animal Welfare Assessment Grid considers procedural parameters (for example when human input is required) in its assessment (Justice *et al.*, 2017); yet clearly procedural elements will be irrelevant to wild animals, so that it seems odd to claim that this is *fundamentally* of value to any animal’s well-being. To do so would be to assume that wild animals are somehow lacking some component to their quality of life. In examples where no explanation is forthcoming OLTs simply do not seem philosophically satisfying.

It may be noted, however, that not all OLTs are philosophically arbitrary in their conception. For example, current HALYs consider health to be the fundamentally valuable thing relating to well-being, basing this in community preferences and expert opinion. However, it might still be noted that this shared feature of HALY assessments, health, remains but a single component to what might be considered our full experience. It seems reasonable that health preferences might be affected by changes in other factors not linked to health. For example, a very rich, healthy individual who is able to pay for any amount of medical support to maintain their health might still be deeply unhappy as a result of other factors in their life. They might show strong preferences for more fulfilling yet less profitable life choices, despite the reduced health that they would have to accept as a consequence of that change. This possibility demonstrates the concern that OLTs can be alienating, lacking sensitivity to the true desires and experiences of the agent.

1.3.4 Perfectionist Theories

One way of grounding the benefits of OLT theories about happiness whilst avoiding the problems of alienation might be to consider a perfectionist theory of well-being. The

ancient philosopher Aristotle defined eudaimonia (well-being) as “activity of soul in accordance with virtue” (Aristotle, 2013, p.10). Furthermore, he argued that eudaimonia does not consist in the same thing for every individual. In the *Nicomachean Ethics* he argued “if the state of mind concerned with a man's own interests is to be called philosophic wisdom, there will be many philosophic wisdoms; there will not be one concerned with the good of all animals (any more than there is one art of medicine for all existing things), but a different philosophic wisdom about the good of each species.” (Aristotle, 2013). Aristotle believed that, for humans, this primarily consisted in their ability to reason, so that in reasoning well a human being may flourish. Such a position on human well-being might be defined as ‘human perfectionism’.

(Human) perfectionism: What is non-instrumentally good for a human is determined by human nature. Human nature involves a specific set of capacities. The Exercise and development of these capacities is non-instrumentally good for humans.”

(Fletcher, 2016, p.79)

A HALY HRQL based on this concept of well-being might consider factors such as the fraction of time available for maximal exercise and development of natural capacities, a qualitative assessment of behaviour, and the degree to which an individual's environment is natural. Assessment factors would, therefore, be similar to the ‘appropriate behaviour’ criterion of the Welfare Quality measure (Canali and Keeling, 2009, p.902). Across different species/individuals, assessments would depend on species/individual-specific capacities and natural behaviour. Such an approach would, for example, seem to echo well with the general approach taken by zoos to ensure that animals are kept in enclosures that mimic their natural environment and allow for natural behaviour and routines.

Whilst the perfectionist approach may seem intuitive when applied to non-human animals, it might be perceived as highly problematic when applied to humans in particular, where ‘natural’ behaviour is a hazy concept. Human environments are hugely varied and constantly changing, with cultural and societal differences as well as considerably varied career and lifestyle choices making for a seemingly endless variety of options to consider in assessing natural behaviour and the exercising of natural capacities. It is not clear that, even for a given individual, there is truly a ‘natural behaviour’, or ‘natural environment’ of any relevance. Perfectionist theories of well-being would seem to ignore entirely the benefits of artificial environments such as Nozick’s proposed ‘experience machine’, a kind

of virtual reality in which maximal hedonistic fulfilment can be found (Nozick, 1974, pp.42–45). For some (such as Nozick himself) this might seem a natural conclusion, but to others it stands as a serious problem in the perfectionist approach.

The supporter of perfectionist theories might see Nozick's thought experiment as fundamentally demonstrating the validity of their position. They might argue that the perfectionist can value the majority of benefits of such a machine as supporting natural behaviour and maximising positive development, but also account for the intuition that the experience will never be fully perfect by making reference to it a fundamentally non-natural environment. Finally, objectors might argue that whilst perfectionist criteria do seem to be connected to well-being, the connection is not explanatory but merely a correlation. The development of natural capacities might, therefore, be seen as tending to generate well-being as a consequence of sharing the same causal factor., be that pleasure, desire fulfilment, or other.

1.3.5 Section Summary

It is clear that the debate regarding the nature of well-being is not one that may be settled here. Nonetheless, the presence of a wide range of plausible theories I believe should encourage a particularly open-minded approach when well-being is assessed in different species, and indeed in different individuals intra-species. It seems that OLTs seem to have taken precedence in current measures when non-human animals are to be assessed which may be the natural result of the need for expert judgement in such assessments, however even if this approach is deemed most suitable an awareness of the various potential concepts about well-being remains crucial if a full and complete list/lists is/are to be compiled.

1.4 Relative Moral Status

In the following section, I discuss various approaches to applying a relative value of well-being in different species (and individuals). The result of which would be a species-specific conversion factor, or alternatively an approach by which relative value is realised within the HQRL measure itself. I discuss each approach to ascribing relative value in turn, considering how they might be justified, and then examining whether the implications raised by each approach lead to plausible outcomes. I also consider any predominant objections that might lead to alternative approaches.

1.4.1 Equal Moral Status

Since HALYs have utilitarian origins, it might seem natural that inter-species HALYs would follow the classical utilitarian line that each individual counts equally, essentially removing any species conversion factors. If fundamental value is to be measured in happiness and suffering, for example, and all sentient beings can be happy and suffer, then the same quantity of suffering or happiness in two separate beings will be equally valuable. There is overwhelming scientific consensus that animals are sentient beings capable of a complex range of emotions (Low *et al.*, 2012), they therefore *consciously* experience pain and suffering, as well as happiness and well-being. If we are willing to accept moral responsibilities towards human animals, out of empathy for fellow sentient beings that have the capacity to experience various states of well-being, then it might seem inconsistent not to extend the same responsibilities to other conscious animals too. As Francoise Wemelsfelder argues, we must “regard animals, fundamentally, as *subjects*”, she continues, “Working with another’s perspective is to recognise their presence, to realise there is someone there – an individual being, not a thing, with an outlook on the world, to whom things matter” (Wemelsfelder, 2012, p.228-229). By recognising the experience of all animals as being affected positively or negatively for similar reasons as human experience is, be that pleasure and pain, preference satisfaction or any other criterion, we might conclude that the corresponding value given to an equal level of well-being is also the same.

An objector to this position might note that the experience available to different individuals is very different. They might question, for example, whether it is reasonable to assume that the experiences of a house fly can be considered as producing well-being effects of equal value to those of a chimpanzee, or even a human being. Such an objection does not necessarily need to undermine the equality position though. The philosopher Peter Singer argues that, whilst “pain and suffering are equally bad—and pleasure and happiness equally good—whether the being experiencing them is human or nonhuman, rational or nonrational, capable of discourse or not” (Singer, 2009, p.576), nonetheless there remain various morally relevant factors which affect how much and the kinds of well-being an individual might achieve. Singer imagines a world where adult human beings are kidnapped at random from parks for the purpose of painful or lethal scientific experiments, and argues that the resulting anticipatory terror would create suffering

additional to the pain of the experiment that would not be felt by non-human animals in the same situation (Singer, 1990, p.15). It might be argued, then, that equal value should be combined with a graduated view of the effect on well-being of any given experience, based on certain relevant aspects of experience.

In his famous essay *Utilitarianism*, J.S. Mill expounds on this idea as a component of the Principle of Utility stating that “That principle is a mere form of words with no intelligible meaning unless one person’s happiness counts for exactly as much as another’s (assuming that they are equal in degree, and with the proper allowance made for differences in kinds of happiness — see pages 5–8 above). Bentham’s dictum, ‘everybody to count for one, nobody for more than one’ might be written under the principle of utility as an explanatory commentary.” (Mill, 2008, p.42). If we are to include sentient animals as ethically significant individuals, then the ‘everybody’ referred to in Mill’s paraphrasing of Bentham might be interpreted to include them too. We might consequently be drawn to the conclusion that HALY HRQL weights for any species should be valued equally, removing any conversion factors from the equation in *Figure 2*. This option would, therefore, attempt to calculate absolute well-being value within each HQRL.

In this model, a rat would, for example, not have a stated limit to its well-being value simply as a result of being a rat. Instead, it will be judged on the same scale as all other beings, its physiology being the only thing that may prevent it achieving the same levels of positive or negative well-being as others. Whilst technically an HRQL score of 1 for maximal or minimal well-being is not unattainable to all creatures, it is simply the case that different species can expect to normally achieve different well-being maximums and minimums so that the HRQL benefits from the same intervention will differ across individuals. Such a system might, however, be said to produce unintuitive results. For example, it would condone the killing of a moderately happy human being in order to prevent the deaths of two fully contented rats were the rats’ full contentedness to produce a score of 0.5 on the objective well-being scale, whilst the moderately happy human being might only reach 0.8. Cumulatively the rats produce an HRQL score of 1 whereas the human only produces 0.8. This intuition against the rats might be explained if the numbers used turned out to be numerically implausible – it might be the case that rats simply cannot produce the levels of well-being cited in the example, full contentedness for them constituting a score closer to 0.2 for example. Alternatively, the intuition could be said to arise as the result of poor levels of epistemic access to the experiences of the

rats, preventing us from appreciating fully how much well-being they do indeed experience.

1.4.2 Moral Status from Complexity of Experience

One might agree with Singer's argument that different kinds of experience are relevant to how much well-being is produced by a given event, but think that, rather than being influential *factors* in well-being effects, rather these differences create *fundamental* differences in the absolute value of different individuals. Such attributes could be seen as dictating and compounding how pleasant or unpleasant experiences are to an individual, making their maximal well-being states less 'bad' or 'good' in absolute terms. Essentially this approach would use qualitative differences to differentiate between quantitatively identical well-being states. Such an approach would, therefore, utilise the conversion factors shown in *Figure 2*. For example, one might interpret Mill's caveat (cited earlier) that equality only follows with "proper allowance made for differences in kinds of happiness" (Mill, 2008, p.42) as referring to fundamental differences in the levels of well-being attainable by different individuals. Following this, one might argue that the ethical value of a well-being change in a given species (or individual) should vary with as the quality and forms of happiness experienced, and the relative degree to which they may be appreciated. As such, different species' (individuals') HQRL weights would be calculated separately based on differing criteria. Relevant factors might practically be divided into differences in sensory inputs such as quality of vision, and differences in processing abilities or brain 'hardware' which might make individuals more aware of suffering.

With regard to sensory inputs, the possession, or lack thereof, of a particular form of sensory perception will alter how much any given species will be affected by losses or gains with respect to that sense. For example, a pain stimulus of the same magnitude in a simpler organism such as a shrimp might produce less suffering than a stimulus of equal magnitude in a human because of the greater sensory complexity of the pain signal. Alternatively, a disease that impedes the hearing of a human being will undoubtedly be disabling, however, the same disease in a bat would be utterly devastating. Not only would its general well-being be degraded, hearing being a bat's primary sense, but it would almost certainly lead to a slow and painful death from starvation as its ability to echolocate and hunt for food would be entirely compromised. The nature of a given species' direct experience of the world as influenced by the array of sensory inputs available to them

might, therefore, be argued to have demonstrable ethical implications. Those that have more developed and complex sensory abilities could be seen as having more to lose than those in whom such abilities are not so developed, and therefore the relative value given to each species would vary in relation to this.

The ethical value that each species receives from any given health change might also be influenced by the degree of mental processing available to them. These being seen as regulating an individual's level of appreciation of its environment and self. Possessing a more developed neocortex, for example, leads to more complex social connections (Dunbar, 2001); this would, therefore, make experiences such as grief, abandonment and isolation more distressing. A similar compounding effect might be seen in species with greater intentionality and the ability to plan, making thwarted expectations harder to endure and heightening the rewards of achieving a goal. Similarly, the ability to form episodic memories would lead to past suffering causing more ongoing distress, and past benefits more happiness (Rogers and Kaplan, 2005, pp.183-186). In summary, the emotional interpretation of an equal stimulus might lead to a response of equal *magnitude*, yet be considered worse due to its greater *complexity* of emotion. It would, therefore, seem unreasonable to value the grief of a solitary sea turtle as equal to that of a sociable gorilla. Similarly, the thwarted expectations of a rat taught, as a reflex action, to expect food when a tone sounds will not be equal to those of a human with plans for future life ventures. As a result of these considerations about experience it might be argued that the value given to each species' well-being should be proportional to their level of cognitive complexity and ability to experience positive and negative well-being states.

A cat's hedonistic HRQL score at maximum pleasure is 1 under this approach, and a human's also 1. However, the cat might receive a species conversion factor of 0.4 and the human 1, making the cat's pleasure worth considerably less than that of a human. An implication of this approach would be that the cat could never be said to achieve the same level of well-being as even a partially happy human being. Even if we were to pump the cat full of dopamine to artificial levels orders of magnitude beyond those it might naturally achieve, equivalent to those of a human being's maximal happiness, its pleasure would still be capped at the 0.4 level.

It might further be objected that such an approach ignores the subjectivity of experience. It seems meaningless, for example, to ask whether a cat's maximal aversion to something is 'worth more' than my maximal aversion to it. For example, level 10

suffering for a cat might be caused by the level of cognitive complexity required only for level 5 suffering in a human, however, it would not be true to say that the cat itself is only experiencing level 5 suffering. Experience is fundamentally subjective and so, to a given individual, all its senses or forms of experience go up to 'level 10'. From this perspective then, different experiences might be seen as morally non-comparable. The supporter of an experience-based position might respond to this objection by arguing that whilst it is true that for the cat all its experiences go up to level 10 *for it*, nonetheless, there remain definite components to its experience which are less developed (such as social bonding perhaps). Whilst human and cat well-being scales might not be comparable, the human can still be said to have definite complexity to certain parts of its experience that the cat does not, they therefore have more to lose from a comparable event. Despite this being the case, however, the 'complexity of experience' supporter will struggle, I believe, to justify the same species conversion factor for all forms of well-being criteria (assuming multiple are to be considered). If it is the case that the cat feels pain with half the complexity, but happiness with equal complexity what conversion factor should we apply? Surely it might make more sense to simply include both complexity and magnitude in the initial HQRL rating than attempting to discount a magnitude assessment at a later stage.

1.4.3 Moral Status Based on Proximity of Kinship

The objector to the previous position might instead note the common tendency to assign greater value to their closer relatives, and similarly to members of their own species when compared to less closely related individuals. The preferential value assigned and greater level of personal sacrifice a parent is willing to make for their own child compared to another's, for example, seems to be indicative of a correlation between biological kinship and our level of responsibility towards an individual. If we accept the premise that what is natural is what is good (following a similar vein of thought to perfectionist theories of well-being), then if it is natural to preferentially value one's closer relatives, such an approach becomes the morally right thing to do. Such a concept of the value of other individuals might lead to a HALY system in which the well-being of fellow humans are valued the most, with a conversion factor approaching 1 applied to HRQLs, depending on the distance of relation. The well-being of our closest genetic relatives (chimpanzees) would receive a conversion factor equal to their genetic similarity to humans, and so on

to all conscious species. This approach would seem to justify the greater moral preference shown by a parent for their own child as compared to somebody else's child.

Arguments against this position point strongly towards a naturalistic fallacy; the idea that moral *oughts* cannot be derived simply from a description of the way the world *is*. That we have urges to preferentially value those most closely related to us does not mean that such an urge is necessarily linked to *moral* value. The greater responsibility of a parent to a child comes, it might be argued, from the same place as the responsibility to care for oneself; if you don't do it, nobody else will. It is therefore a 'responsibility' of prudence but is devoid of any moral connections. As the Stanford Encyclopaedia of Philosophy notes; "Regardless of why one has a given trait, the question for a rational agent is always: is it right for me to exercise it, or should I instead renounce and resist it as far as I am able?" (FitzPatrick, 2016).

An implication of the kinship condition is that we would be led to value a more distantly related creature's well-being as less even if it happened to experience its suffering/positive well-being more strongly than species more closely related to us. The value, for example, of a sentient alien capable of extremes of well-being beyond our imagination would always be 0 when compared to any terrestrial life form with which we share a common ancestry. We should therefore, following this approach, be prepared to sacrifice the alien's life for even the most insignificant of well-being improvements to an earthworm, who might perhaps have experienced mild discomfort from being temporarily beneath the alien's shadow.

1.4.4 Section Summary

Given that proximity of kinship does not seem to produce any *ethically* relevant basis for discrimination between individuals, and the degree by which an individual experiences the world seems to put unreasonable caps on an individual's well-being, even if artificial, I believe a fundamentally equal approach remains most appealing. No conversion factor would, under this model, be applied in the equation shown in *Figure 2* so that equal well-being in different individuals will always be judged as equal. In the calculation of the HRQL (well-being) score, recognition would instead be given to the fact that different individuals will experience different levels of well-being following an equal change in their physical circumstances; for example, some species might naturally

experience less pain than others. Such an approach would be able to account for variations in the intensity of experience whilst also affording ethical status to highly developed aliens to whom we have no shared genetic history.

5 Conclusion

The aim of this thesis was to explore the ethical considerations of well-being measurement across multiple species, with specific reference to health-adjusted life years (HALYS). To do so it has discussed the need for the ethical recognition of non-human animal well-being as a consequence of their possession of conscious experience, and noted the lack of appropriate consideration in the present cost-effectiveness analysis outputs of health-adjusted life years. It has considered the possible forms that well-being might take across different species and individuals, analysing each and suggesting the implications these might have for an inter-species HALY. It also considered various potentially relevant criteria to the apportionment of graded (or not) ethical value across a spectrum of individuals, both within and across species. It reflected on the implications of applying equal value, experience-dependent value, and value according to proximity of kinship, and concludes that an equal value approach seems to represent the most ethically appealing option.

If an inter-species health measure is to be realised, then considerable areas of further inquiry will be required. Fundamentally, more discussion is needed on the fundamental structure the measure should take, be that an adapted HALY, some other similar adapted measure, or an entirely new approach. Engagement between animal well-being experts, ethicists and other relevant interested parties will also be required to answer the questions discussed in this thesis, providing some consensus on the ethical standing and well-being systems of non-human animals. In a world of increased connectivity, heightened public interaction with contemporary issues, and a richer than ever scientific understanding of the conscious lives of animals, now more than ever there is call for an honest and full accounting of inter-species well-being. By simply providing perspective to the scale of avoidable animal suffering, let alone use in the appraisal of well-being improvement options, such a measure would provide untold value. Whilst an initial attempt might be basic and flawed, it would represent a first step on the path to a more complete and ethically justified future of well-being maximisation.

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